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IN THE

Supreme Court of the United States

OCTOBER TERM—1939

No. 9

STANDARD BRANDS INCORPORATED,
Petitioner,

vs.

NATIONAL GRAIN YEAST CORPORATION,
Respondent.

REPLY BRIEF FOR PETITIONER

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Respondent's argument against the validity of the patents boils down to the contentions that it was within the skill of the ordinary worker, and did not involve the exercise of patentable invention:

First, to combine the step of using inorganic ammonium salts as a substantial source of nitrogen and the step of neutralizing the deleterious excess of developed inorganic acidity during propagation, into a unitary yeast propagating process (patent –103); and

Second, to combine the step of initiating propagation in a diluted fraction of wort and the step of feeding in concentrated reserve wort during propagation to maintain the dilution (i.e. nutrient content) in the vat substantially constant, into a unitary process of yeast propagation (patent –105); and

Third, to combine the four steps of using inorganic ammonium salts as a substantial nitrogen source, initiating propagation in a diluted fraction of nutrient solution, neutralizing the deleterious excess of developed inorganic acidity during propagation, and feeding in concentrated reserve solution at a rate to maintain the dilution (i.e. nutrient content) in the vat substantially constant, into an integral process of yeast propagation (patent –106).

It is believed that the unsoundness of these contentions sufficiently appears from the chemical and technical facts set forth in detail in Petitioner's Main Brief and judicially marshaled in the decisions of the prior litigation reported at 8 F. (2d) 186, 13 F. (2d) 570 and 38 F. (2d) 329.

The propriety of adopting or rejecting the contentions may also be tested fairly from a more non-technical approach, as follows.

As to the –103 Patent

Respondent advances the Jacquemin British patent dated 1896 (R. II, 127) and the Fritsche Austrian patent dated 1895* (R. II, 154) to show that the discrete step of employing inorganic ammonium salts in a nutrient solution was old. It advances the Wilfert Article dated 1890** (R. II, 171) to show that the discrete step of neutralizing acidity was old.

This means that for twenty years before Hayduck the art had before it knowledge of the first step separately

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* Jacquemin gave no indication of the amounts of inorganic salts or of yeast yields and, while Fritsche states amounts, he states that the process brought about a yield increase in one case by as much as 3½% and in another case by as much as 12%. Such slight improvements are to be contrasted with Hayduck's patent –103 improvement in yield of nearly 100%.

** Wilfert of course dealt with a step entirely *preliminary* to yeast manufacture, and effectuated no neutralization *during propagation.*

and knowledge of the second step separately, which steps respondent contends were combinable obviously and without patentability to render the Hayduck 103 patent invalid.

The non-technical, but extraordinarily pertinent, question thereby presents itself of why, if the combination was obvious, no worker in the art for twenty years made that combination; and particularly why was it so long not done when its later doing brought about all the advantages of increased yield, better quality and economies which the record concedes to have occurred?

This Court has posed that question often, and has emphasized its telling significance, as follows:

> "But it is plain from the evidence, and from the very fact that it was not sooner adopted and used, that it did not, for years, occur in this light to even the most skilful persons. It may have been under their very eyes, they may almost be said to have stumbled over it; but they certainly failed to see it, to estimate its value, and to bring it into notice. Who *was* the first to see it, to understand its value, to give it shape and form, to bring it into notice and urge its adoption, is a question to which we shall shortly give our attention. At this point we are constrained to say that we cannot yield our assent to the argument, that the combination of the different parts or elements for attaining the object in view was so obvious as to merit no title to invention. Now that it has succeeded, it may seem very plain to any one that he could have done it as well. This is often the case with inventions of the greatest merit. It may be laid down as a general rule, though perhaps not an invariable one, that if a new combination and arrangement of known elements produced a new and beneficial result, never attained before, it is evidence of invention." (*Loom Company* v. *Higgins*, 105 U. S. 580, 591)

> "The fact that in a decade of an eager quest for higher speeds this important chain of circumstances had escaped observation, the fact that no one had applied a remedy for the consequent trouble until Eibel, and the final fact that when he made known

his discovery, all adopted his remedy, leave no doubt in our minds that what he saw and did was not obvious and did involve discovery and invention." (*Eibel Process Company* v. *Minnesota & Ontario Paper Company*, 261 U. S. 45, 68)

"Many things, and the patent law abounds in illustrations, seem obvious after they have been done, and, 'in the light of the accomplished result,' it is often a matter of wonder how they so long 'eluded the search of the discoverer and set at defiance the speculations of inventive genius.' *Pearl* v. *Ocean Mills*, 11 Off. Gaz. 2. Knowledge after the event is always easy, and problems once solved present no difficulties, indeed, may be represented as never having had any, and expert witnesses may be brought forward to show that the new thing which seemed to have eluded the search of the world was always ready at hand and easy to be seen by a merely skillful attention. But the law has other tests of the invention than subtle conjectures of what might have been seen and yet was not. It regards a change as evidence of novelty, the acceptance and utility of change as a further evidence, even as demonstration." (*Diamond Rubber Company* v. *Consolidated Rubber Tire Co.*, 220 U. S. 428, 434-5)

Respondent's brief offers no answer to that inquiry. The Circuit Court of Appeals decision below perhaps implies that the War for the first time made the combination commercially desirable, by saying:

"In later years, particularly during the course of the World War which required conservation of grains, molasses was used as the source of sugar in the making of nutrient solutions in lieu of cereals. In 1919 inorganic salts capable of nourishing yeast were used in place of organic nitrogenous materials." (R. p. 672)

Respondent's witness at the trial attempted to explain the failure of the art until Hayduck to combine the steps constituting the process of patent -105 by saying that the World War in Europe and Prohibition in the United States made such process for the first time economically

desirable,* but, did not give this explanation or any other for the failure of the art to combine the steps constituting the process of patent –103.

It is not disputed that the benefits of doubled yield, improved quality, and others resultant from the process of patent –103 would have been just as valuable for twenty years before Hayduck's invention as during the time since. It is believed to be more reasonable to conclude, therefore, that the failure of the art for twenty years to combine the steps into the unitary process constituting the claimed invention of patent –103 is attributable to the inability of the workers in the art to do so; and as a corollary that Hayduck, when he did so, exercised patentable invention beyond the skill of the ordinary worker.

This conclusion moreover harmonizes with the other known facts. For example, the prior knowledge of the separate step of using inorganic salts was that such use was of slight commercial advantage. Jacquemin in 1896 indicated no advantage whatever and Fritsche in 1895 indicated an increase of yield by as much as 3½% in one case and by as much as 12% in another. Wilfert in 1890 utilized the discrete neutralizing step preliminary to any yeast propagation, and indicated no improvement in yield. Moreover, Wilfert's discrete step had been proved unpromising as indicated by its characterization in another reference in the record (American Distillers' Review, dated 1914, R. II, 161),** which states:

> "One may work according to the Wilfert or other sulphuric acid methods which specify from 0.8 to 3.6 degrees of acidity, **but these methods are uncertain and full of trouble.**" (Emphasis ours throughout)

Respondent's Brief at various places (for example pages 6, 10, 16) states that the "prior art knew that a yeast wort should be *maintained* slightly acid". The references just mentioned and others cited by respondent do not

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* This explanation will be discussed presently (p. 9).

** This reference was not mentioned by the Court below.

support this statement. Wilfert (R. II, 171), and American Distillers' Review (R. II, 161), Molhant British patent (R. II, 133) and Pollak, Swiss patent (R. II, 151) dealt solely with the acidification of the wort prior to any propagation of yeast therein. In other words, so far as they suggested a favorable slight acidity, the suggestion concerned merely the acidity of the wort before yeast manufacture began. None of these references suggested any control of the acidity of the nutrient solution during the yeast propagating period, and it elsewhere appears in the record that the practical yeast art never added an antacid to the wort during the propagating period (R. I, 337).

To make a thing "obvious", and therefore devoid of the exercise of patentable invention in the sense of the patent law, it is necessary to show that the desirability of the combination and the actual putting together of the steps, that is, the making of the combination, were both obvious from the prior art. In the present case, respondent's evidence lacks any prior art reference to supply the first of these requirements, namely, to indicate the desirability and utility of the Hayduck combination.

The Henneberg references (R. II, 158; and 163) do not supply this missing link. Henneberg expressly denied the desirability or utility of the combination in any commercial yeast manufacturing process by saying that inorganic ammonium salts were innocuous in ordinary tap water, such as used by the yeast manufacturer. Even in the case of distilled water these Henneberg references indicate no benefit by way of improved yield of product or any other economies from the step of neutralizing released acidity.* The full Henneberg references, mere abstracts of only one of which are in the present record, were in the record in the Maryland litigation on the -103 patent, and as Judge Soper points out in his decision there:

* Henneberg's neutralization was not controlled for the "deleterious excess" of acidity.

"No firm conclusion can be drawn from this study of the beneficial effect of chalk upon the quantity of yeast. On the contrary, one who sought guidance chiefly for the production of yeast in large quantities would be led to abandon rather than to adopt the addition of chalk."

"Dr. Lamb testified without contradiction that from a careful examination of the tabulated results, he had ascertained that, in experiments with race 12, either much or very much yeast was obtained without the use of chalk in 4 of the 5 ammonium solutions, and in nearly every instance with some one or the other of the remaining 6 yeasts, some yeast growth was obtained in all of the 5 solutions without the addition of chalk. When he added the chalk, there is only a single instance where much yeast was reported. That instance is solution 5. With it there are several instances cited where yeast growth occurred when chalk was used, but with the same solution there are similar statements about the growth of yeast before the addition of chalk." (8 F. (2d) 186, 194)

Henneberg's 1907 and 1908 laboratory experiments did not convey, even to him, the significance now assigned to his article by respondent. His "Prakticum" of 1909 made no mention of the possibility of using inorganic ammonium salts with neutralization of deleterious acidity in yeast manufacture. (Petitioner's Main Brief, p. 28). Respondent's Brief (p. 18) now argues that his 1909 book may have been written before his 1907 and 1908 experiments were conducted. But the textbook shows the contrary, as Judge Soper's opinion pointed out,

"The character of the work is such as to lead one to expect that such a disclosure would be made if the author were in possession of the fact. It is quite clear that he included the results of his most recent investigations of the two prior years. If it were obvious to him that he had made a discovery of great practical value in the manufacture of yeast, it is difficult to understand why he would not have told it while freely making public other matters which were of value in the fermentation industries." (8 F. (2d) 186, 196).

It is submitted that the failure of any one in the art for twenty years to do what respondent says was obvious when done, compels the conclusion in common sense and sound law that it was beyond the skill of the ordinary worker and called for the exercise of patentable invention.

As to the -105 Patent

The same question arises here. If combining the step of initiating propagation in a highly diluted nutrient solution and the step of constantly feeding in a concentrated reserve solution at a rate to maintain the dilution (i.e. nutrient content) in the propagating vat substantially constant, was obvious, why did the art fail so long in making this combination? This question was asked respondent's witness Rautenstrauch. He had admitted under cross examination that, despite Rainer (R. II, 135) dated 1879, the entire industry until Hayduck's date had adhered to the invariable practice of a straight-set mash (that is, the whole nutrient solution, of relatively high density, was placed with the seed yeast in the propagating vat at the beginning of the process), and had therefore failed to make practical use of the knowledge that if the propagation were conducted in a highly dilute solution the nutrients would be assimilated in the production of increased yeast yields and decreased alcohol yields. This appears as follows:

> "XQ. 387. Inasmuch as you have stated that the commercial practice for the period of thirty-six years included the use of straight set mashes and the use of such mashes of relatively high Balling, is it your opinion that that commercial practice departed from the use of relatively high dilutions of sugar because the use of relatively high dilutions of sugar would have entailed other and overbalancing disadvantages?
> A. No sir." (R. I, 233)

He was then asked to give his explanation why the art for thirty-five years or more had declined to do what respondent argues was a matter of routine. The testimony is:

"XQ. 388. In your opinion, what is the reason the art persisted for thirty-five years or more in using high Balling straight set worts?

A. I will be very glad to answer that question, sir. Prior to 1914, and years perhaps prior to that, the desire was to create yeast and alcohol. All during that period the art was advancing and developing and people learned how to produce yeast without much alcohol by having dilute solutions, but, as in many arts, it was not availed of until commercial circumstances made it desirable. We find that in almost all the arts. The commercial circumstances which made it desirable were, in this country Prohibition; in Germany, particularly, the desire was to grow yeast for its food value, particularly for stock food. Germany was then at war, was pressed for food for its—

Mr. Watson: Can we confine the answer, if the Court please, to United States practice?

Mr. Philbin: That wasn't the question, your Honor.

The Witness: I am answering the question.

The Court: Proceed, Doctor.—

A. (Continuing) In Germany, the desire for stock food was so pressing that these people began to avail themselves of what was known in the art, and from the fact that the art had been so thoroughly developed in regard to the possibility of growing yeast without alcohol they could do it quickly, there was no long period of experimentation, and the Germans immediately got into the production of yeast instead of alcohol, and were able to do so because of this art which had been established; and it is because of these commercial conditions that that conversion was made, and because of the fact that this art was revealed in the literature and the patents they could do it quickly, and there was no long period of experimentation.

XQ. 389. You say the desire influenced the commercial practice, and you stated that the desire was to make yeast and alcohol. Can we go a little further back and say that the manufacturer's desire and the usual and normal desire was to get products of the greatest value from his given raw materials?

A. In Germany that value being measured in nutrition for cattle, and that was the value which they were seeking. In the United States the value of alcohol

was destroyed by Prohibition; unless, of course, you wanted to be a bootlegger." (R. I, 233-235)

This explanation, on its face, might seem plausible. But further cross-examination immediately brought out that the explanation had been arrived at by the witness on *post hoc, ergo propter hoc* logic. The soundness of the explanation depended of course on the facts as to relative values of yeast and alcohol during this interval, *and the witness had no knowledge of these values.*

"I do not know the fair, typical selling prices of bakers' yeast or alcohol over the period from Rainer to 1916 in general or any particular portion of this period." (R. I, 235)

On the other hand, petitioner's witness Kaltenbach, who had been with the Fleischmann Company about fifty-five years, did know the facts, and showed that the assumption that Rautenstrauch had made in his explanation was totally unsound. Kaltenbach's testimony was:

"Q. 11. And can you give me comparative figures as to the value of yeast produced from a gallon of molasses with an 80 per cent. yield, as compared to the value of the alcohol which you produced in a straight fermentation for alcohol from that molasses?

A. The yeast was decidedly better value." (I, 331)

* * * * * * *

"Q. 18. * * * Can you tell me whether or not the Fleischmann Company was always interested in increasing its production of yeast?

A. Yes.

Q. 19. And decreasing the alcohol yield?

A. Yes.

Q. 20. I believe the question is whether or not it was interested.

A. They were always anxious to increase their yeast yield." (R. I, 332)

and further:

"XQ. 39. Considering these gallons of molasses that you used to make some alcohol, and to make some

yeast out of, you got a certain amount of money for the yeast that you got from that molasses, and a certain amount of money from the alcohol, can you tell us which item was the most profitable to you; not which item you got the most in gross return, but which you made the most money out of?

A. The yeast business. It was the business of the firm. They strove to develop that. All their energies were directed to selling yeast and producing it.

At times we lost money on the alcohol we sold. I don't recollect that that was ever true of the yeast business." (R. I, 334)

The 1892 Polsky British patent (R. H, 123) also shows that the higher value of yeast was then known, and greater yeast yield was being sought.

Petitioner's expert witness Lamb also testified that Rautenstrauch's assumption was unsound, as follows:

"Q. 388. On pages 233 to 235 of the record defendant's witness, Dr. Rautenstrauch, expressed the opinion that the yeast industry continued to use straight-set high Balling mashes for 35 years or more prior to Hayduck's invention patents in suit, particularly '105, because until 1915 the operation which is patented and which is the subject of this suit, would not have been useful and that it became useful in Germany on account of the war and in the United States on account of Prohibition. Do you agree with Dr. Rautenstrauch's conclusion?

A. No, I cannot believe that. The great advances which these inventions made possible in yeast manufacture had a utility and have a utility wholly independent of their utility during the war or during Prohibition. Of course it is evident that if that were not the case these patents would not have been carried on subsequent to the war or subsequent to the repeal of Prohibition. The patents recorded a real technical advance which made them valuable, irrespective of those special factors which were operative during the war and during Prohibition." (R. I, 401)

It thus is established that the stale-mate of the art from the date of the reference (Rainer, 1879) which respondent

asserts made Haydúck's –105 process obvious, was not at all for the reason advanced by respondent's witness Rautenstrauch.

We submit it as more reasonable to conclude that this history of the art is consistent only with the characterization of the –105 process as beyond the mere skill of the ordinary worker. Moreover, this conclusion is also harmonious with and confirmed by other record facts.

For example, the practical art could glean no indication from Rainer that the step of initiating propagation in a highly dilute wort nor the step of continuously adding supplemental nutrients to maintain substantially constant nutrient content during propagation was a practical thing to do. This is established by the present record in two ways. First, and as Judge Soper pointed out (38 F. (2d) 338), Kiby in his Handbook of Pressed Yeast Manufacture, dated 1912, sets forth:

> "Dr. Rainer in Vienna obtained in 1879 a patent for the manufacture of compressed yeast without the production of alcohol; much peptone and a little sugar were brought to fermentation; nevertheless the process did not come to a successful realization. All the large scale experiments to that end were uniformly unsuccessful." (R. I, 441)

Second, as Judge Soper there also pointed out, the Rainer process resulted in uncommercial yeast yields. A counterpart of this evidence is offered by the present record where respondent's witness, Free, conducted *ex parte* experiments purporting to duplicate the Rainer disclosure. Petitioner commented on these experiments in its Main Brief at pages 47-48 and the Brief for Respondent (pp 28-29) criticizes these comments, but bases its criticisms on a misinterpretation of petitioner's argument. The data used by Free in the professed reproductions are given in the record (I, 517). From these, by simple arithmetic, it appears that the "41%" and the "53%" yields claimed by Free were actually respectively about 36% and 40% on

the raw materials he used. A much greater correction, however, is necessary. The Rainer patent clearly states that the peptones and sugar going to make up the nutrient solution shall be in the ratio of two of peptone to one of sugar. Free actually reversed this ratio, making it one of peptone to two of sugar. As pointed out by Lamb, such departure was a flagrant violation of the directions of the patent Free purported to follow.

> "Q. 471. Dr. Free said that he used amounts of peptone and sugar in the fermenter to start in his repeated experiments of 10 and 1, which are his so-called Rainer experiments, a peptone and sugar ratio of 2 to 1, and he added sugar and peptone according to the figures which are on the record, so that considering the total peptone and total sugar over the full-test period, the peptone and sugar ratio was 1 to 2; in other words, the ratio at the start was reversed during the progress of the test. Do you find in the Rainer patent any disclosure of the procedure followed by Dr. Free in this respect?
>
> A. I do not, sir. This patent, which is quite confused in many respects, is clear and definite in all of its indications on the principle that the sugars shall be added at about only one-half the concentration of the peptones. That principle is adhered to throughout where any reference to amounts is made, and Dr. Free departed from this clear and unequivocal teaching of the patent in this respect to a marked degree." (I, 438-9)

Now, therefore, since Free gave us the information that he obtained one unit of peptones from three units of the malt sprouts comprising his raw materials, it is again a matter of simple arithmetic to demonstrate that, if he had truly followed the Rainer disclosure, he would have employed four times the quantity of malt sprouts, which he did employ, and that in figuring the yield of his yeast product he would have necessarily found it to be below 20%. As stated, this conclusion is a simple matter of

arithmetic.* It harmonizes with, and is explained by, Judge Soper's discussion of the reference in 38 F. (2d) 329, 334-35, 338. Of course, it also harmonizes with, and confirms, the characterization in the Kiby Handbook that commercial efforts to make use of the disclosure of the Rainer patent of 1879 were "uniformly unsuccessful".

The evidence discussed above is not commented on in the opinion below of the Circuit Court of Appeals for the Third Circuit. This evidence, however, proves the following crucial statement in that opinion to be in error:

> "We are convinced, however, that there is little difference in substance between beginning fermentation with a wort at 1° Balling and adding nutrient solution at 12° Balling from time to time to prevent the excess production of alcohol as taught by Hayduck** and beginning the fermentative processes with such a low

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* Since Free obtained only ⅓ unit of peptone from each unit of malt sprouts used he would (had he followed Rainer) have had to use 12 units of malt sprouts, i.e. 4 units of peptone, and 4 units of molasses (containing 50% sugar), i.e. 2 units of sugar, to have a peptone to sugar ratio of two to one and to obtain a yeast yield of 2.5 to 3 units of yeast. This would give a yeast yield of $\frac{2.5}{12+4} = 15.6\%$, or $\frac{3}{12+4} = 19\%$ on the raw materials. On page 28 of its Brief respondent questions why petitioner did not offer testimony by its own witnesses, as to Rainer's yield. The answer is that mere arithmetic applied to Free's results made separate evidence unnecessary.

** The Court misstates the Hayduck –105 process by saying that the 12° Balling is added "from time to time". It is added "slowly and substantially continuously" at a rate equal to the consumption by the yeast of the nutrients from the solution, to maintain the concentration of the nutrients "substantially constant" during the period of propagation. This is contrasted with Rainer, who adds lump doses of sugar at uncertain intervals and only when the sugar theretofore in the solution in the vat has been all or mostly all consumed.

concentration of sugar in the nutrient solution that the feeding yeast will not produce excessive alcohol as taught by Rainer * * *." (R. I, 682)

The "difference" between Hayduck's process and Rainer's process was all the difference between success and failure.

It is submitted that respondent's statement that the War in Europe and Prohibition in the United States first made it desirable for the practical art to combine the step of initiating propagation in a highly dilute nutrient solution and the step of substantially continuously feeding in relatively concentrated nutrient solution at a rate to keep the dilution (Balling) in the propagating vat substantially constant, is wholly disproved by the record facts discussed above. It is, therefore, necessary to adopt the contrary conclusion, which, moreover, harmonizes with all the facts, namely, that the failure of the art to combine steps into a unitary process which comprises the Hayduck -105 invention was because either the desirability of that combination or the actual putting together of the steps into that combination, or both, was not obvious and was beyond the capability of the ordinary skilled worker in the art.

The benefits which flowed from the process, after Hayduck invented it, would have flowed from the process if it had been devised during all those thirty-five years prior to Hayduck. The same profit motive obtained during all those years. It would seem that the only conclusion, which alike appeals to common sense and sound law, is that the combination was not "obvious" and that the Hayduck patent -105 is valid.

As to the -106 Patent

Here respondent's argument of obviousness rests altogether on counsel's mere assertion.

There is no denial that the invention of this patent (for example claim 13) covers a unitary process comprising

four steps *in combination*, namely, inorganic ammonium salts as a nitrogen source in the nutrient solution, initiating propagation in a portion of the solution highly diluted, during propagation feeding in the concentrated reserve solution substantially continuously to maintain the nutrient content in the propagating vat substantially constant, and neutralizing the deleterious excess of acidity released from the inorganic salts during propagation.

Respondent's argument is merely the assertion that, the Court below having held the process which includes the sub-combination of a certain two of those steps (i.e., inorganic salts and neutralization) unpatentable, and the discretely different process which comprises the sub-combination of the other two steps (i.e., initiating propagation in a highly dilute portion and feeding concentrated reserve to maintain substantially constant Balling) unpatentable, it must follow (!) that a third process combining all four steps in combination could not be patentable.

There is a fatal flaw in such argument. Respondent cites no reference of the prior art which its witnesses or its counsel even profess to assert as disclosing either the desirability or the practicability of integrally combining all four steps into a unitary process. In the absence of any such reference whatever in the prior art, respondent's mere assertion of "obviousness" is without any tenable basis.

Actually, the Court below rested its adverse holding with respect to patent -106 on its mere holding that patents -103 and -105 were respectively invalid. As pointed out in Petitioner's Main Brief, the validity or invalidity, per se, of patents -103 and -105 is of no significance on the question of the validity of -106. For reasons also there expressed, patents -103 and -105 are not prior art against patent -106 under the heretofore followed doctrine of the various Circuit Courts of Appeals. The reason why they are not prior art against the same inventor (being copending applications), although they might be prior art against a different inventor, appears clearly

from Section 4886 of Revised Statutes, (U. S. C. title 35, § 31), the pertinent portion of which reads:

> "Any person who has invented or discovered * * * any new and useful art, * * * not known or used **by others** in this country, before his invention or discovery thereof, and not patented or described in any printed publication in this or any foreign country, before his invention or discovery thereof or more than two years prior to his application, and not in public use or on sale in this country for more than two years prior to his application, * * * may * * * obtain a patent therefor."

The knowledge of Hayduck as to the –103 and –105 processes was not knowledge "by others". It was not prior art against him, though it might have been against a different inventor.

Actually, moreover, there is no evidence whatever to justify the assumption made by respondent (its Brief, p. 50) that another than Hayduck might not have obtained a valid patent for the four-step combination, assuming it was the newcomer's invention. On the contrary, the entire record supports the presumption of validity of patent –106, irrespective of the patentee's name (as long as he was the true inventor), and supports the conclusion that the four-step combination process was a patentable invention on the part of its originator.

Patents –105 and –106 Are Not Indefinite

The argument of Respondent's Brief (pp. 34-46) needs some reply because it seems to petitioner that the argument purports to rest upon a ground other than that dealt with in the decision of the Circuit Court of Appeals below.

The trial Court held that the disclosure of the patent was not adequate as to the rate of feed of the concentrated reserve wort into the diluted wort during the propagation. This holding was repeated by the Circuit Court of Ap-

peals for the Third Circuit as discussed in Petitioner's Main Brief, pages 50-54.

Respondent's Brief takes the position that the indefiniteness concerns the question of whether the propagation of the yeast is to take place in the solution diluted to about 1° Balling on the one hand, or between 3° to 5° Balling on the other hand.

It is petitioner's position that the propagation occurs in the solution at about 1° Balling and it is respondent's position that the patent directs it to take place in the solution at about 4° Balling.

We submit that the language of the patent clearly supports petitioner's position and as clearly refutes respondent's position. The evidence of the witnesses likewise establishes the correctness of petitioner's position.

The patent states that a relatively concentrated solution is first prepared,

> "A wort adapted for yeast propagation (having, for example a gravity of 12° Balling) is prepared according to the procedure commonly followed in the compressed yeast industry." (R. II, 5, ll. 66-70)

It next specifies that a portion of the solution is placed in the propagating vat and diluted [with water] to about 1° Balling and that propagation of the yeast is then initiated:

> "A part of this wort is placed in the fermenting vat and is highly diluted (for example, to about 1° Balling), yeast is added thereto and it is aerated." (R. II, 5, ll. 70-73)

The patent continues to instruct that the 12° Balling reserve wort is then added slowly and substantially continuously at a rate such that the sugar will be consumed in making yeast and not in making alcohol, and that this means at a rate such that the 1° Balling at which propagation is initiated shall remain substantially constant:

> "Thereupon the remainder of the concentrated wort is added slowly and substantially continuously throughout a protracted period of time and at a rate such that not only the alcohol which may have been formed from the quantity of sugar present in the diluted portion of the wort, but also any alcohol which may be formed from the sugar which is present in the added wort, can be assimilated immediately by the yeast." (R. II, 5, ll. 74-84)

and

> "at a rate such that the concentration of the dilute wort remains substantially constant," (R. II, 5, ll. 45-47)

The witnesses are all in agreement that this objective instruction of the patent can be fulfilled only by initiating propagation in the solution at a dilution of about 1° Balling and feeding in the more concentrated reserve so that the nutrient concentration in which propagation is occurring remains substantially constant at about 1° Balling. Respondent's witness Free conceded this by saying:

> "I agree that about 1 degree Balling is the desirable concentration in the fermenter during the propagating period for efficient utilization of the nutrients toward maximum yeast production and minimum alcohol production, assuming that that 1 degree Balling represents substantially the sugar concentration, percentage of fermentable sugar."* (R. I, 560)

Respondent's Brief proceeds to argue, however, that another statement in the patent is inconsistent with the statements quoted above, and gives a contrary teaching that the propagation shall occur in a solution having a concentration of about 4° Balling. The statement pointed to by respondent, however, deals neither with the rate of feed, nor with the Balling of the solution in which yeast

* This assumption had been earlier conceded correct by respondent's other witness Rautenstrauch. (R. I, 201)

propagation *is occurring.* It deals on the contrary with the quantitative division of the initially prepared 12° Balling into two parts, one part to be diluted to 1° Balling in which propagation is begun and the other part to remain at 12° Balling and to be used as the reserve for feeding in. The sentence in question reads:

> "The quantity of the diluted wort which is originally available for the yeast is so chosen, for example, that the mean content of the entire wort employed would be 3° to 5° Balling." (R. II, 5, ll. 90-95)

Dr. Lamb explains the significance of this instruction, its novelty in the art, and its practical importance at R. I, 63, 65, Qs. 39 and 40.

If the sentence means, as respondent contends, that the concentration of the solution in which propagation is occurring has to be raised from 1° Balling (at which it is explicitly stated to start) to 4° Balling, then that result could be accomplished only by feeding in the 12° Balling reserve at a rate much faster than the nutrients were being consumed by the yeast. This was admitted by Free, as follows:

> "XQ. 415. Starting the propagation in the fermenter with a nutrient solution of 1 degree Balling, can you raise the Balling within the range of 3 to 5 during any substantial part of the propagating process in any other way than feeding in more concentrated yeast nutrients to the fermenter during that period?
>
> A. I don't know—I think it probably cannot." (R. I, 564)

In other words, respondent's position is that the sentence involves the rate of feed of the reserve solution. Respondent's Brief points out in a footnote on page 43 that:

> "Petitioner's counsel during the trial denied that the 3 to 5 language 'concerns the rate of feed during

yeast manufacture', saying that it dealt 'with the preselection in preparation to begin' (R. I, 410), and that 'It has nothing to do with the feeding, with the rate of feeding. It has a great deal to do with the yeast manufacture' (R. I, 412)."

Respondent's Brief, however, disingenuously fails to add that during the trial respondent's counsel conceded that the language in question did not refer to the rate of feed, as follows:

"I agree with Mr. Watson that that sentence has nothing to do with the rate of feed but, if anything, it has to do with the dilution and the quantity. I agree with that." (R. I, 355)

Since, therefore, we have respondent's concession that the sentence in question does not concern the rate of feed, it must be taken as established that the sentence relates to the fractional **division** of the 12° Balling wort into one part (for dilution to 1° Balling to initiate propagation) and the remaining part (to be fed in as concentrated reserve). This being so, there is no inconsistency and no indefiniteness in the patent, either on the point of dividing the 12° Balling into two portions, one for dilution and the other for reserve feed in, or on the point of feeding in the concentrated reserve so that the nutrients are added at the same rate the nutrients are being consumed by the yeast; and the Balling of the solution in the propagating vat consequently remains substantially constant at 1°.

From the foregoing it also appears that the sentence quoted concerns an arithmetical computation, a formula, of great usefulness in yeast manufacture. It does not mean that the 1° Balling of the initial fraction and the 12° reserve are ever physically dumped together to raise the composite Balling to 4°; but only that the relative quantities of the two are so chosen that if they were merely dumped together they would give a 4° Balling.

Respondent's Brief (p. 42) states that Hayduck's "3 to 5 rule" as interpreted by Lamb was purely hypothetical

and of no interest to the yeast manufacturer. Lamb's testimony as to how the yeast manufacturer would avail himself of this rule reads:

> "You do this before any yeast manufacturing begins. You *could* perform a hypothetical experiment, mixing these two, dilute and concentrated solutions, together, and if you obeyed the rule and took the right proportions of those substances, liquids, you will have a mean Balling of 3 to 5. *The yeastmaker does not have to do that because he has a pen and pencil and he can do it in a moment with arithmetical calculation.*" (R. I, 369-70)*

That this formula is of great utility is proved by the evidence which shows that both The Federal Yeast Corporation (R. I, 619) (enjoined in the Maryland litigation) and the respondent (R. I, 86, 91, 97) here, actually conducted their processes in accordance with the formula. The novelty of the formula is established by the complete absence of any prior art which is even asserted to disclose or forecast it.

Respondent's argument of indefiniteness against patent –105 is thus wholly unsound.

While respondent advances the same argument against patent –106 also, it should be pointed out that this patent does not contain the same sentence. This patent clearly states:

> "the seed yeast may be added in the first instance to a solution of a strength of about 1° Balling and containing also a proportionate amount of nutrient salts which are used, and thereafter during the growth of the yeast the solution containing about 10% of sugar and a proportionate quantity of the nutrient

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* An example of how the yeast manufacturer makes his computation in order to know what portion of the reserve wort to dilute was given by petitioner's witness Lamb (R. I, 375; cf. Pltf's. Exh. 19, R. II, 85), and at R. I, 397-98 witness pointed out the reason why the rule is important and the resultant disadvantages if the yeast manufacturer did not follow it.

> salts, may be added slowly and substantially continuously so as to maintain the concentration of the solution in which the yeast is propagating approximately constant or at a slightly greater or less concentration during the main portion of the period of propagation." (R. I, 9, ll. 19-33)

and

> "The rate of addition and the duration of the process may be determined in accordance with tests so that the concentration remains approximately constant * * *." (R. I, 9, ll. 65-68)

The "tests" referred to consist in mere observations of the saccharimeter (the common instrument for Balling measurement), so that if the Balling tends to decrease then the rate of more concentrated feed is increased, and if the Balling tends to increase then the rate of feed is decreased, so that in either case the constancy of Balling is maintained in the propagating solution.

Respondent's Brief now disputes that simple observations of the saccharimeter would be sufficient. Under the heading, "The use of a density gauge does not save the patent." It says:

> "The gauge measures the total amount of solids in the wort, including seed yeast, propagated yeast, grain materials, molasses materials, salts, etc., and does not measure the amount of sugar in the wort, as pointed out by respondent's witnesses, without contradiction." (p. 45)

Turning to the record, however, we find respondent's witness Rautenstrauch answering questions of the trial Court, as follows:

> "The Witness (aside to the Court): You have clearly in mind, your Honor, that degree Balling refers to the sugar content?
>
> The Court: Well, not entirely to sugar, does it, Doctor?
>
> The Witness: Generally.

The Court: It is just a measurement of the sugar content, is it?

The Witness: Yes, generally.

The Court: In other words, the Balling scale is the sugar scale, is it?

The Witness: Generally. If it is an entire sugar solution, then it is absolute. Where the sugar predominates, it approximates. So that when you refer to the Balling of the mash, you are interested in that reference to the amount of sugar. It shows it relatively." (R. I, 200-201)

Petitioner's witness, Lamb, testified to the same effect in the language already quoted.

The technical correctness of, and the record support for, the matter on pages 50 to 54 inclusive of Petitioner's Main Brief are both thus wholly substantiated.

Miscellaneous

Respondent's Brief stoops to certain arguments which either have no proper bearing on the ultimate issues involved or which are without record support.

1. For example, it states (p. 3) that the acid constituents of both the inorganic ammonium salts (ammonium phosphate and ammonium sulphate) are utilized by the yeast, and implies that no acidity problem arises from the use of these salts. This is entirely contrary to the proved facts in this and the prior Maryland litigations. On page 5 Respondent's Brief states that respondent "independently developed its own processes * * * The equities of the case are strongly against petitioner". Neither statement has any record support whatever. Respondent carefully kept off the stand any witness having first hand knowledge of respondent's processes and their development. What those processes are is relevant in this case only to the question of infringement, an issue not now before this Court. We feel we should add, however, that respondent's processes closely parallel those

of the defendant in the Maryland litigation held to infringe, (cf. footnote 38 F. (2d) 338) and that respondent is merely the usual deliberate infringer.

2. On pages 16 and 17, Respondent's Brief draws the conclusion from its processes that inorganic salts may be useful without neutralization. But whether those processes included neutralization is a question of infringement, and that question is not now before this Court. Petitioner is wholly prepared in the proper forum to establish its case of infringement and to prove that neutralization is employed in each of respondent's processes.

3. On page 21, Respondent's Brief asserts that the District Court in the Maryland litigation held patent 103 valid on the mere ground that it taught the use of the process for large scale commercial production instead of for laboratory procedure. A reading of the Maryland decision (8 F. (2d) 186) and of the decision of the Circuit Court of Appeals for the Fourth Circuit (13 F. (2d) 570) shows that respondent's statement is most unfair and incorrect.

4. Respondent's Brief makes short reference (pp. 30 and 33) to the article of Delbruck (R. II, 174) and the prior foreign patent of Kamienski (R. II, 142). Neither of these was referred to by the opinion of the Circuit Court of Appeals below and their non-anticipatory nature is clearly pointed out in the prior decision of Judge Soper (38 F. (2d) 329, 335 and 337).

5. On pages 42-44 Respondent's Brief asperses petitioner's expert witness, Arthur B. Lamb. Lamb is professor of chemistry at Harvard University and Director of the Chemical Laboratory at that institution. He is past president of the American Chemical Society and a member of the American Academy of Arts and Sciences, the Washington Academy of Sciences and of the National Academy of Arts and Sciences (R. I, 52). He appeared as petitioner's witness in the former Maryland litigations

and has been intimately familiar with the subject matter for many years.

Respondent's witnesses were Rautenstrauch and Free. Rautenstrauch teaches Industrial Engineering at Columbia University. He was brought into the case below only a week before the trial (R. I, 194). Prior to his industrial engineering course, he taught mechanical engineering. He is not a chemical engineer. He had been a consultant with the J. G. White Management Corporation, he was in the real estate business with the Fred F. French Company, and for a time with the Splitdorf Electrical Company (R. I, 242-243). His knowledge of yeast manufacture was acquired from 1923 to 1926 while in a mere managerial relation with the Liberty Yeast Corporation. In preparing for his testimony, he "did not read the opinions of the District Court and the Court of Appeals for the Fourth Circuit in the cases against the Federal Yeast Corporation" (R. I, 195).

Free stated:

> "I do not pretend to be a practical yeast maker and I have no intention of testifying concerning the practical manufacture of yeast in any way" (R. I, 270-271).

He also had not read the opinions of the Courts in the Maryland litigation (R. I, 551) before testifying.

6. An inspection of the opinions of this Court cited in Respondent's Brief makes adequately clear the reasons why none is inconsistent with holdings of validity of the three patents now before the Court. Lest the Court be led into error by the unsound textbook statement in Respondent's Brief (p. 50) from Walker on Patents; Deller Edition, p. 1275;

> ' where a patent contains two claims which are alike, except that the narrower one of them calls for an unpatentable addition to what is called for by the other, the narrower claim is void"

it should be pointed out that the author rests it on the citation of three earlier cases, the first of which was reversed on a point which destroyed the trial Court's conclusion (*Featherstone* v. *George R. Bidwell Cycle Co.*, 57 Fed. 631); the second of which held invalid a claim differing only by including set screws (*Packard* v. *Lacing Stud Co.*, 70 Fed. 66, 68); and the third of which was reversed on the very point involved (*Consolidated Car-Heating Co.* v. *West End St. Ry. Co.*, 85 Fed. 662).

Conclusion

It is submitted that the three Hayduck patents should be held valid.

Respectfully submitted,

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